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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/657,939	09/09/2003	Hamid Ould-Brahim	42871-0004	1612
23577	7590	10/02/2007		
RIDOUT & MAYBEE SUITE 2400 ONE QUEEN STREET EAST TORONTO, ON M5C3B1 CANADA			EXAMINER HOANG, HIEU T	
			ART UNIT 2152	PAPER NUMBER
			MAIL DATE 10/02/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/657,939

Applicant(s)

OULD-BRAHIM, HAMID

Examiner

Hieu T. Hoang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to the communication filed on 09/14/2007.
2. Claim 24 is new.
3. Claims 1-24 are pending and presented for examination.

Response to Arguments

4. Applicant's arguments have been fully considered but they are not persuasive.
5. The only main argument is focused on two new limitations added to independent claims 1, 12 and 23, wherein the applicant argues that the prior art does not teach: "allow said elements of said first subset of elements to establish Layer-3 peering with said second set of elements to exchange routing information" and "Layer-2 connectivity between elements within said first subset of elements at the Layer-2 level across said Layer-3 VPN service."
6. For the first limitation, it is respectfully submitted that the prior art Ould-Brahim alone discloses "allow said elements of said first subset of elements to establish Layer-3 peering with said second set of elements to exchange routing information." From the specification, and to the best of the examiner's understanding, this limitation refers to a reachability distribution mechanism wherein a customer edge device CE and a provider edge device PE peer together to exchange routing information that they have to each other using a BGP protocol (specification, fig. 4, CE-PE link 407 is a L3 BGP "link"). The prior art Ould-Brahim discloses just that (fig. 2, page 6 last par. to page 7 par. 5,

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“When a service provider adds...is populating the PITs”, this portion discloses a CE may pass to the PE (PE ONE) customer port information or routing information that the CE knows by using BPG (p.7 par. 2); vice versa, the PE passes the information stored in the PE ONE PITs or port information table to the attached CEs also by using BGP (p.7 par. 5))

7. For the second limitation, it is respectfully submitted that the prior art Ould-Brahim alone discloses “Layer-2 connectivity between elements within said first subset of elements at the Layer-2 level across said Layer-3 VPN service.” Ould-Brahim discloses a Layer-2 MPLS signaling mechanism wherein the CE signals to request the provider network to establish a connection to a target port—a destination port of another CE in the same VPN (page 7 par. 6). This signaling mechanism is layer-2 while the provider network functions based on Layer-3 BPG (page 6 par. 5), therefore reading on “Layer-2 connectivity between elements within said first subset of elements at the Layer-2 level across said Layer-3 VPN service.”

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claim 24 is rejected under 35 U.S.C. 102(b) as being anticipated by Ould-Brahim et al. (BGP/GMPLS Optical VPNs, hereafter Ould-Brahim).

10. For claim 24, Ould-Brahim discloses a network for providing switched virtual circuit Layer-2.5 VPNs, said network comprising:

a plurality of customer edge devices associated in a Layer-2 Virtual Private Network (page 7 par. 6 and 7, L2 MPLS signaling for connectivity between CEs in a same VPN across a provider network);

a plurality of provider edge devices associated in a Layer-3 Virtual Private Network (page 6 par. 5, across L3 BGP provider network), where each provider edge device of said plurality of provider edge devices is configured to:

- receive Layer-3 routing instructions from an attached customer edge device of said plurality of customer edge devices (page 7 par. 2, CE passes CPI or routing information to PE using L3 BGP);
- receive Layer-2 data frames from said attached customer edge device and route said Layer-2 data frames through said Layer-3 Virtual Private Network according to said Layer-3 routing instructions (page 7 par. 6 and 7, PE receives L2 MPLS connection establishing request from a CE and transport that request, page 6 par. 5, across L3 BGP provider network across a L3 BGP provider network)

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ould-Brahim further in view of Rosen et al. (BGP/MPLS VPNs, hereafter Rosen)

13. For claim 1, Ould-Brahim discloses a network for providing switched virtual circuit Layer-2 VPNs, said network comprising:

- a set of elements interconnected by services (fig. 2, a set of elements containing customer edge routers (CE) and provider edge routers (PE));
- at least one first subset of said elements defining a private network (fig. 2, subset CE's defining virtual private networks such as VPN-A);
- at least one second subset of elements different from said first subset defining a provider network wherein at least two subgroups of said first subset of elements may be connected via said provider network (fig. 2, p. 4 par. 7, subset PE's is a provider network, two subgroups such as the CE1 and the CE2 that are in a same VPN-A are connected together through the PE provider network), said second subset of elements

implementing a Layer-3 VPN service (page 6 par. 5, L3 BGP provider network);

- a provisioning mechanism used to define element membership in said first subset of elements (abstract, single end provisioning, adding a new port to a given VPN only involves changes on the devices connected to that port, p. 3 par. 7 and 8, a pair of CE's could be connected through the service provider, provisioning changes such as adding a new port to a given VPN (or a new member) only affect the PE and the new added CE that is connected to the PE through that port, section 3, par. 1 and 3, each CE has a unique customer port identifier (CPI) within a VPN, defining its membership within the provider network);
- a plurality of customer ports maintained on said elements of said first subset of elements (section 3, par. 1 and 3, each CE has a unique customer port identifier (CPI) within a VPN, defining its membership within the provider network);
- a plurality of provider ports maintained on said second set of elements, each of said plurality of provider ports connected by services to a customer port (section 3 par. 3, each PE port has a unique provider port identifier PPI), wherein said services allow said elements of said first subset of elements to establish Layer-3 peering with said second set of elements to exchange routing information (p.7 par. 2, a CE may pass to the PE (PE ONE) customer port information or routing information that the CE knows by using BPG; p.7 par. 5, the PE passes the information stored

in the PE ONE PITs or port information table to the attached CEs also by using BGP);

- a port information table at each element of said provider network having a provider port among said plurality of provider ports, said port information table containing mapping information relating addresses of said customer ports to addresses of said provider ports for said first subset of elements (fig. 2, PE with a port information table, p. 6 par. 3, each PE has a port information table (PIT) containing a list of customer port information CPI and provider port information PPI pairs);
- a signaling mechanism used to create Layer-2 connectivity between elements within said first subset of elements at the Layer-2 level across said Layer-3 VPN service implemented by said second subset of elements (p. 7 par. 6, L2 GMPLS signaling to create connection between client devices that are connected to the customer edge routers; page 6 par. 5 across L3 BGP provider network);
- such that a layer-2 VPN may be provided across said layer-3 VPN service (p. 7 par. 6, L2 GMPLS signaling to create connection between client devices that are connected to the customer edge routers; page 6 par. 5 across L3 BGP provider network).

Ould-Brahim does not explicitly disclose a reachability distribution mechanism.

However, Rosen discloses a reachability distribution mechanism (p. 7 par. 1, section 4.2.2, route reachability information at CE1 can be distributed to CE2 and CE3 of a same VPN).

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Ould-Brahim and Rosen in order to apply the reachability distribution capability of Rosen to Ould-Brahim's system to use Border gateway protocol (BGP) to distribute VPN routes among PE routers (Rosen, section 4, par. 1)

14. For claim 2, Ould-Brahim/Rosen discloses the invention substantially as in claim 1. Ould-Brahim/Rosen further discloses said reachability distribution mechanism uses a Layer-3 VPN service (Rosen, section 4.2.2, par. 1, VPN-IPv4 is a layer-3 VPN service).

15. For claim 3, Ould-Brahim/Rosen discloses the invention substantially as in claim 2. Ould-Brahim/Rosen further discloses said a subset of Layer-3 VPN service piggybacks VPN routes onto the backbone Border Gateway Protocol (Rosen, section 4, par. 1, BGP is used to distribute VPN routes among PE routers).

16. For claim 4, Ould-Brahim/Rosen discloses the invention substantially as in claim 2. Ould-Brahim/Rosen further discloses said a subset of Layer-3 VPN service uses a virtual router redistribution scheme (Rosen, section 4.2.2, par. 2,

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redistributing routes either to an autonomous system border router or to a route reflector).

17. For claim 5, Ould-Brahim/Rosen discloses the invention substantially as in claim 1. Ould-Brahim/Rosen further discloses said signaling mechanism is an MPLS signaling mechanism (Ould-Brahim, p. 7 par. 6, MPLS signaling).

18. For claims 6 and 7, Ould-Brahim/Rosen discloses the invention substantially as in claim 1. Ould-Brahim/Rosen further discloses an auto-discovery mechanism for distributing said mapping information to port information tables of said provider network using Border Gateway Protocol (Ould-Brahim, p. 6 par. 4, 5 and 6, local information (PE PIT information received from the attached CEs) can be distributed to other PEs in of said VPN through a provider network using BGP).

19. For claim 8, Ould-Brahim/Rosen discloses the invention substantially as in claim 1. Ould-Brahim/Rosen further discloses said provisioning mechanism operates in conjunction with said signaling mechanism to restrict element connectivity to elements of said first subset (Ould-Brahim, p. 6 par. 6, import route targets restrict the set of routes that could be imported from provider's BGP into the PIT to only the routes that have at least of these communities).

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20. For claim 9, Ould-Brahim/Rosen discloses the invention substantially as in claim 1. Ould-Brahim/Rosen further discloses said data and signaling services have IP signaling services (Rosen, section 4.1, VPN-IPv4).

21. For claim 10, Ould-Brahim/Rosen discloses the invention substantially as in claim 1. Ould-Brahim/Rosen further discloses said customer port addresses need be unique only within said first subset of elements (Ould-Brahim, par. 1, customer port address needs not to be unique across several VPN's).

22. For claim 11, Ould-Brahim/Rosen discloses the invention substantially as in claim 1. Ould-Brahim/Rosen further discloses said customer port addresses and provider port addresses use an addressing scheme chosen from the group of IPv4, IPv6, and NSAP (Ould-Brahim, section 3, par. 1-3, IP address is chosen as port identifier).

23. For claim 22, the claim is rejected for the same rationale as in claim 11.

24. For claim 12, Ould discloses a method of organizing a network having a set of elements interconnected by services, wherein at least one first subset of said elements defines a private network and at least one second subset of elements different from said first subset defines a provider network implementing a layer-3 VPN service and wherein at least two subgroups of said first subset of elements may be connected via said provider network, said method comprising:

- defining element membership in said first subset of elements via a provisioning mechanism (abstract, single end provisioning, adding a new port to a given VPN only involves changes on the devices connected to that port);
- establishing a plurality of customer ports within said elements of said first subset of elements (section 3, par. 1 and 3, each CE has a unique customer port identifier (CPI) within a VPN);
- establishing a plurality of provider ports within said second set of elements, each of said plurality of provider ports connected by services to a customer port (section 3 par. 3, each PE port has a unique provider port identifier PPI), where said services allow said elements of said first subset of elements to establish Layer-3 peering with said second set of elements to exchange routing information (p.7 par. 2, a CE may pass to the PE (PE ONE) customer port information or routing information that the CE knows by using BPG; p.7 par. 5, the PE passes the information stored in the PE ONE PITs or port information table to the attached CEs also by using BGP);
- establishing a port information table at each element of said provider network having a provider port among said plurality of provider ports, said port information table containing mapping information relating addresses of said customer ports to addresses of said provider ports (fig. 2, PE with a port information table, p. 6 par. 3, each PE has a port information table (PIT) containing a list of CPI and PPI pairs);

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- creating Layer-2 connectivity within said first subset of elements at the Layer-2 level across said layer-3 VPN service implemented by said second subset of elements via a signaling mechanism thereby allowing provisioning of a layer-2 VPN across said layer-3 VPN service while allowing provision of layer-3 services (p. 7 par. 6, GMPLS signaling to create connection between client devices that are connected to the customer edge routers, page 6 par. 5, across L3 BGP provider network); Ould-Brahim does not explicitly disclose determining reachability across said second subset of elements;

However, Rosen discloses determining reachability across said second subset of elements (p. 7 par. 1, section 4.2.2, route reachability information at CE1 can be distributed to CE2 and CE3 of a same VPN).

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Ould-Brahim and Rosen in order to apply the reachability distribution capability of Rosen to Ould-Brahim's system to use Border gateway protocol (BGP) to distribute VPN routes among PE routers (Rosen, section 4, par. 1)

25. For claim 13, the claim is rejected for the same rationale as in claim 2.

26. For claim 14, the claim is rejected for the same rationale as in claim 3.

27. For claim 15, the claim is rejected for the same rationale as in claim 4.

28. For claims 16 and 17, the claims are rejected for the same rationale as in claims 6 and 7.

29. For claim 18, the claim is rejected for the same rationale as in claim 8.

30. For claim 19, the claim is rejected for the same rationale as in claim 5.

31. For claim 20, the claim is rejected for the same rationale as in claim 9.

32. For claim 21, the claim is rejected for the same rationale as in claim 10.

33. For claim 23, Ould-Brahim discloses a method of organizing a network having a set of elements interconnected by services, wherein at least one first subset of said elements defines a private network and at least one second subset of elements different from said first subset defines a provider network and wherein at least two subgroups of said first subset of elements may be connected via said provider network (fig. 2, subset of CEs, subset of PEs, two CEs can be connected via a provider network), said method comprising:

- defining a L2VPN topology (fig. 2, VPN topology);
- establishing a plurality of customer ports within said elements of said first subset of elements (section 3, par. 1 and 3, each CE has a unique customer port identifier (CPI) within a VPN);

- establishing a plurality of provider ports within said second set of elements, each of said plurality of provider ports connected by data and signaling services to a customer port (section 3, par. 1 and 3, each CE has a unique customer port identifier (CPI) within a VPN), wherein said services allow said elements of said first subset of elements to establish Layer-3 peering with said second set of elements to exchange routing information (p.7 par. 2, a CE may pass to the PE (PE ONE) customer port information or routing information that the CE knows by using BPG; p.7 par. 5, the PE passes the information stored in the PE ONE PITs or port information table to the attached CEs also by using BGP);
- creating a Layer-2 Port Information Table for each provider port among said plurality of provider ports; and establishing the identity of said customer ports attached to each provider port among said plurality of provider ports, and populating the Layer-2 Port Information Table at said each provider port with mapping information relating addresses of said customer ports to addresses of said provider ports (fig. 2, PE with a port information table, p. 6 par. 3, each PE has a port information table (PIT) containing a list of CPI and PPI pairs);
- distributing said mapping information to Layer-2 Port Information Tables of said provider network via an auto-discovery mechanism (p. 6 par. 4, 5 and 6, local information (PE PIT information received from the attached CEs) can be distributed to other PEs in of said VPN through a provider network using BGP);

- creating Layer-2 connectivity within said first subset of elements at the Layer-2 level across said layer-3 VPN service implemented by said second subset of elements via a signaling mechanism upon request from an element within said first subset of elements thereby allowing provisioning of a layer-2 VPN across said layer-3 VPN service while allowing provision of layer-3 services (p. 7 par. 6, GMPLS signaling to create connection between client devices that are connected to the customer edge routers, page 6 par. 5, across L3 BGP provider network) Ould-Brahim does not explicitly disclose determining reachability across said second subset of elements via a Layer-3 VPN service.

However, Rosen discloses determining reachability across said second subset of elements via a Layer-3 VPN service (p. 7 par. 1, section 4.2.2, route reachability information at CE1 can be distributed to CE2 and CE3 of a same VPN).

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Ould-Brahim and Rosen in order to apply the reachability distribution capability of Rosen to Ould-Brahim's system to use Border gateway protocol (BGP) to distribute VPN routes among PE routers (Rosen, section 4, par. 1)

Conclusion

34. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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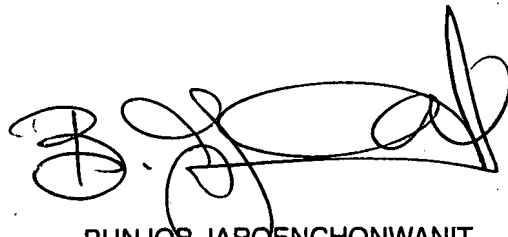
35. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hieu T. Hoang whose telephone number is 571-270-1253. The examiner can normally be reached on Monday-Thursday, 8 a.m.-5 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bunjob Jaroenchonwanit can be reached on 571-272-3913. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HH



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9/27/7